



HYPOTRICHOSIS

IN BELTED GALLOWAY CATTLE

Many breeds of cattle are afflicted with a number of genetic conditions. But thanks to modern research and scientific developments, identifying the specific gene that causes each of these abnormalities has become a reality. Belted Galloway breeders report the intermittent calf born exhibiting varying degrees of hair loss or hypotrichosis symptoms.

Manifestations of hypotrichosis are evident at birth or within 72 hours of birth. Generally hair loss at pressure/rub points at the joints of the inner legs followed by the additional hair loss on the legs and the belt. Regrowth of hair and the subsequent loss has been noted in some animals held past weaning age. On rare occasions, excessive hoof growth has been noted, elongated bodies, unusual head shapes, or below-average growth rates.

Through the scientific research of Dr. Jonathan Beever PhD at the University of Illinois Urbana-Champaign, the hypotrichosis (HY) recessive gene in the Belted Galloway breed was identified. Dr. Beever developed an accurate diagnostic test for the identification of the gene. Belted Galloway breeders contributed to Dr. Beever's research by submitting blood/semen samples of many symptomatic animals that included dams/sires that were suspected carriers of the hypotrichosis (HY) recessive gene. Also, whole herd samplings were volunteered for genetic diversity in the study. As a minor breed of cattle, with limited means, we are grateful that Dr. Beever was willing to invest his expertise and resources to identify the hypotrichosis (HY) gene. Sample testing was done through batch processing requiring 30+ individual blood/semen samples to be submitted in order to process testing. Over time, our breeders began to make requests for the availability to process an individual sample (HY) results could be expedited when the information was time sensitive.

UC Davis, the provider of the laboratory services that verify DNA parentage for the Belted Galloway breed, confirmed that they will offer hypotrichosis testing on a per sample basis with the submission of hair, blood, or semen. As an added bonus, Belted Galloway breeders have the option to test an animal for DNA parentage and hypotrichosis with the same sample submitted.

The results of those animals that were hypotrichosis tested through Dr. Beever's research have been used as a management tool to make informed breeding decisions. By identifying (HY) carriers through official testing, breeders have avoided producing (HY) calves by not mating (HY) carrier cattle.

Tom and Pete, two Belted Galloway breeders, shared their past hypotrichosis experience. Tom had been a breeder of Belted Galloway cattle for 20 years. He purchased a bull from Pete—a breeder who had genetics that Tom felt would be beneficial in his breeding program. Tom's new bull bred 12 females in herd and several months later two calves were born that did not have any hair on their inner legs. One calf did not have hair in the belt and visible pink skin was present.

In those early years when symptomatic calves were born, the sire was faulted. But what Tom and Pete did not know was that both the sire and dam of a calf must possess the (HY) gene for the calf to exhibit hypotrichosis symptoms. Today a breeder like Tom is able to test his herd to identify known carriers of the recessive trait. And Pete is able to test both the sire and dam of the bull he sold to determine the source of the (HY) gene carrier.

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FREQUENTLY ASKED QUESTIONS

What is the procedure for requesting testing?

Requests are submitted to the Executive Director via the online form at beltie.org or via email with the required information: animals, name/registration number, if registered; some form of a unique ID (name or tattoo is best) if unregistered. Also required: sex; birthdate; sire name and registration number; dam name and registration number; plus the name and address of the member who is requesting the test/their designated representative. The Executive Director will use the information to generate the UC Davis paperwork and it will be forwarded by email to the individual requesting the test. Instructions for collecting and submitting the hair sample along with payment information will be included. Please note that hair that has previously been submitted for DNA parentage is on file at UC Davis and can be tested for hypotrichosis.

UC Davis will send the results to the Executive Director's office and the report will be forwarded to the member/representative requesting the test and the registrar's office.

What are the fees for hypotrichosis and DNA parentage testing?

Hypotrichosis testing is \$30 and DNA parentage testing is \$45 which may be requested in combination or separately. Animals can be tested before they are registered. Hypotrichosis testing is mandatory in bulls being registered, donor females and ET calves being registered.

Explain the probability of a calf born to two carriers of the hypotrichosis (HY) recessive gene. Also, if a non-carrier animal is bred to a (HY) recessive gene carrier animal—what is the likelihood of their progeny carrying the gene?

When two animals are mated that possess the recessive (HY) gene, progeny have a twenty-five percent probability of being afflicted/symptomatic. Half of their progeny will potentially carry the (HY) recessive gene. Progeny of a non-carrier animal bred to an animal that carries the recessive (HY) gene have a fifty percent probability of carrying the gene, and zero probability of exhibiting signs of the condition. Hypotrichosis testing is a diagnostic tool to aid breeders to make informed breeding decisions regarding animals that carry the (HY) recessive gene. To request testing contact the Belted Galloway Society office at executivedirector.bgs@gmail.com or visit the bull registration tab at beltie.org

Carrier x Carrier Mating

	H	h
H	HH	Hh
h	Hh	hh

25% - Affected
50% - Carrier - Not Affected
25% - Non-Carrier - Not Affected

Carrier x Non-Carrier Mating

	h	h
H	Hh	Hh
h	hh	hh

50% - Non-Carrier - Not Affected
50% - Carrier - Not Affected